

**US-Mexico Border 2012 Program:  
Strategy for Indicator Development**

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## I. INTRODUCTION

Border 2012 is a binational environmental program managed by the U.S. Environmental Protection Agency (USEPA) and Mexico's Secretariat of Environment and Natural Resources (SEMARNAT). Its mission is to "protect the environment and public health in the U.S.-Mexico border region, consistent with the principles of sustainable development." Possessing adequate information is essential to protecting the environment and public health; recognizing this, the National Coordinators of the Border 2012 program agreed to "measure program progress through development of environmental and public health-based indicators," "achieve concrete, measurable results" and "strengthen capacity of local community residents and other stakeholders to manage environmental and environmentally-related public health issues."<sup>1</sup> The purpose of this strategic document is to provide a foundation for the identification, development, and use of a basic set of indicators for the Border 2012 program.

These indicators will provide accurate information regarding the state of the environment and human health along the US-Mexico border, thus creating a basis for comparing changes in the environment to changes in public health. The indicators should also help to monitor the effectiveness of the activities of the US-Mexico Border 2012 program and measure progress toward achieving its goals and objectives. Collectively, indicators will provide information that both policy-makers and the public can understand, forming a basis for making well informed decisions.

This strategic document provides context for border indicators and facilitates cooperative work between all stakeholders and entities of Border 2012, particularly by fostering communication between and within the binational regional workgroups, taskforces, and policy fora. Much work has already been completed on indicators and environmental health issues in the border region; however, too many of these efforts are isolated. It is important to build upon pre-existing relationships and investments, and integrate with previous indicators work in a deliberate and purposeful manner, specifically addressing the local communities that are the target audience of Border 2012. Ultimately, all stakeholders will benefit from developing and maintaining sound indicators that are applicable binationally.

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<sup>1</sup> "Border 2012 Framework: US-Mexico Border Environmental Program"  
Available at: [http://www.epa.gov/usmexicoborder/pdf/2012\\_english.pdf](http://www.epa.gov/usmexicoborder/pdf/2012_english.pdf) p.3



## II. BACKGROUND

The U.S.-Mexico border region is characterized by conditions that could contribute to further decline of the environment and health of border communities. Projected population and economic growth has resulted in unplanned development, greater demand for land and energy, traffic congestion, increased waste generation, and overburdened or unavailable waste treatment and disposal facilities.<sup>2</sup> There is evidence that documents the relationship between these environmental conditions and health problems in border residents, including waterborne and respiratory diseases.<sup>3</sup> Such situations pose a challenge to the development of environmental and health infrastructure and capacities to effectively manage these issues at the local and regional levels.

Since the 1983 La Paz agreement, the United States and Mexico governments have undertaken cooperative initiatives implemented through multi-year binational programs. Border XXI preceded the Border 2012 program and marked the first binational attempt to develop environmental indicators for the border region, making tangible contributions to understanding the quality of the environment and its likely impact on public health. The revised Border 2012 agreement sets goals and objectives through the year 2012 to be accomplished by regionally-focused workgroups and media or issue-specific task forces. This program emphasizes a bottom-up approach and includes local decision-making, priority-setting, and project implementation. The Border 2012 goals encompass aspects of air, water, and land contamination; environmental health; chemical exposure via accidental release and terrorism; and compliance, enforcement and environmental stewardship.

The Border 2012 program also mandates that indicators be developed and used to demonstrate real, meaningful, and measurable results. In order to ensure that these goals are met and to increase overall capacity to respond to environmental and health problems at the border, the Border Indicators Task Force (BITF) was established in December 2003. The role of BITF is to coordinate with all Border 2012 groups and stakeholders in order to define a set of indicators as well as develop protocols for the collection, analysis, and quality control of the data necessary for the calculation and interpretation of those indicators. Ongoing review of indicators will provide partners and decision-makers with an informative tool that can help shape research and public health and environmental public policy priorities.

Various stakeholders will be involved in the development and use of indicators. In addition to the federal environmental agencies - the USEPA and SEMARNAT - federal health agencies such as the US Department of Health and Human Services, in particular its Centers for Disease Control and Prevention (CDC), and the Mexican Secretariat of Health (Secretaría de Salud) participate in the Border 2012 program. The state and local health and environmental departments on both sides of the border are also key players in this process, as well as international organizations such

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<sup>2</sup> "Border 2012 Framework: US-Mexico Border Environmental Program"  
Available at: [http://www.epa.gov/usmexicoborder/pdf/2012\\_english.pdf](http://www.epa.gov/usmexicoborder/pdf/2012_english.pdf)

<sup>3</sup> "Exhaled Nitric Oxide in Asthmatic Children and Traffic Density in the US-Mexico Border: Preliminary Results from the EVA Study (Vehicular Emissions and Asthma)"  
F. Holguin et al



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as the Pan American Health Organization (PAHO) and the Southwest Center for Environmental Research and Policy (SCERP).

### III. CONCEPTUAL FRAMEWORK FOR US-MEXICO BORDER 2012 INDICATORS

Consistent with worldwide trends, interest in US-Mexico border indicators started increasing in the mid-1990s. Many international organizations (including the United Nations Environment Program (UNEP), the World Health Organization (WHO), and the Organization for Economic Cooperation and Development (OECD)), federal and state governments of countries across the world, as well as non-governmental organizations use indicators to monitor their programs, plan their next actions, and track trends. Overall, indicators serve three main functions:

1. Provide information on the system or process in an understandable way;
2. Evaluate the effect of performed policy actions and plans;
3. Assist in highlighting data gaps, and then translating collected data into policy relevant information<sup>4</sup>

Indicators become useful, informative tools when they are related to a conceptual framework that holistically describes the interactions within a system. A conceptual framework will concretely aid the Border 2012 program by giving it several characteristics, including<sup>5</sup>:

- Transparency of program strategy and goals
- Consensus and improved communication and participation of stakeholders
- Flexible, dynamic process design that is able to absorb new information
- Systems-approach to complex problems strengthening capacity of stakeholders to manage environmental and environmentally-related public health issues
- Systematic way to conceptualize information from many different sources

In  
the  
Border  
XXI  
program,

the **Pressure-State-Response (PSR)** conceptual framework was used to conduct indicators work.<sup>6</sup> This primarily linear model follows the logic that a Pressure causes a change in State, which then evokes a societal Response. However, the PSR framework is limited in its application; it does not account for the complex ecological processes and human-environment interactions. More specifically, it provides no explanation for impacts that may result from changes in State, nor does it provide a means for Responses to affect the system in a dynamic, cyclical manner. The priorities of the Border 2012 program require a more comprehensive conceptual framework that will account for outcomes within the system.

The **Driving Forces-Pressure-State-Impact-Response (DPSIR)** conceptual framework is an extension of the PSR model resulting more suitable for Border 2012 needs. It is also based on the idea that anthropogenic activities impact the environment, and that adverse environmental

<sup>4</sup> United Nations World Water Development Report. 2003. Chapter 3, "Signing Progress: Indicators Mark the Way." Available at: [http://www.unesco.org/water/wwap/wwdr/table\\_contents.shtml](http://www.unesco.org/water/wwap/wwdr/table_contents.shtml)

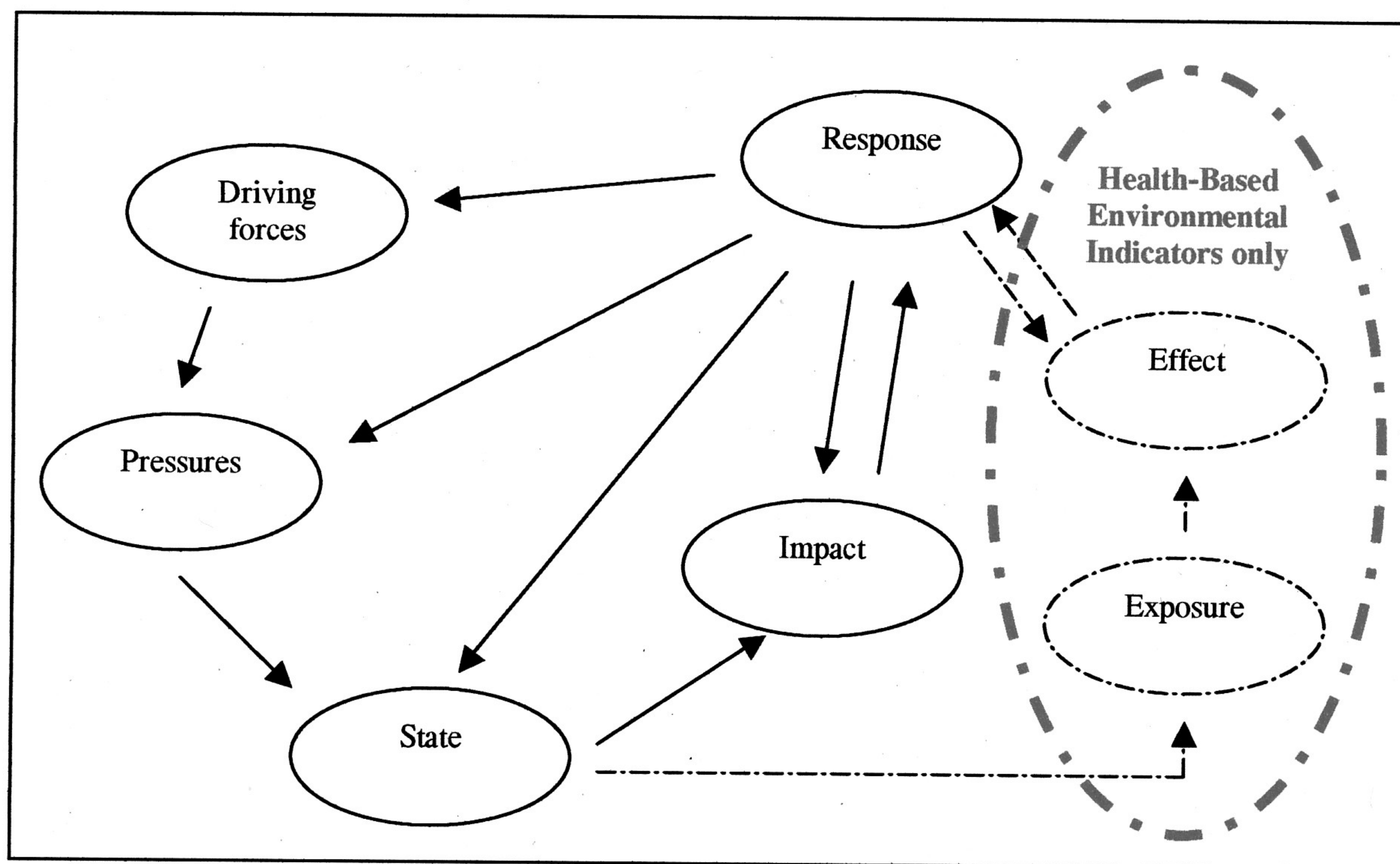
<sup>5</sup> Adapted from: "National Core Set of Environmental Indicators for State of Environmental Reporting, South Africa." 2001. Available at: [http://www.environment.gov.za/soer/indicator/docs/Scoping\\_Report\\_Vol1.pdf](http://www.environment.gov.za/soer/indicator/docs/Scoping_Report_Vol1.pdf)

<sup>6</sup> "US-Mexico Border XXI Program: Progress Report 1996-2000." Available at: <http://www.epa.gov/usmexicoborder/progress/eng/index.htm>



impacts induce humans to curtail or manage the pressure-exerting activities. However, the DPSIR framework introduces two additional concepts: 1) human well-being is related to environmental quality; and 2) society's behavior and economic pressures affect the environment and thus, human well-being.<sup>7</sup> This framework incorporates these concepts by adding the categories "Driving forces" and "Impacts" to the PSR framework (see Figure 1). Therefore, in the DPSIR framework, societal Driving forces lead to anthropogenic Pressures, which lead to a State, which generates Impacts that evoke Responses. The "Responses" compartment feeds back into every other compartment, showing that interventions can occur at each point along the causal spectrum. Further explanation and examples of each compartment are given below.

For health-related environmental indicators, an adjustment to the model can be made. It is possible to divide "Impact" into two different components: "Exposure" and "Effect." Exposure refers to the intersection between people and hazards inherent in the environment, while Effect refers to the health effects caused directly by exposure to environmental hazards. With this modification, there is a directional path from State to Exposure to Effect, before finally linking to Response.



**Figure 1: DPSIR Conceptual Framework**

### **Driving Forces**

*Driving Forces are socio-economic factors that cause environmental change, which positively or negatively influence pressures on the environment. Common examples of*

<sup>7</sup> Gentile, A.R. "From National Monitoring to European Reporting: the EEA Framework for Policy-Relevant Environmental Indicators." European Environment Agency. Available at: <http://www.desertification.it/asv/doc/ASINARA%20WEB/04gentile.htm>



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Driving Forces are population size and make-up, use of resources, and education levels (e.g., number of inhabitants or energy consumption).<sup>8</sup>

### Pressures

*Pressures are natural or anthropogenic factors that directly influence the state of the environment.* As the OECD describes, Pressures “change [the environment’s] quality and quantity of natural resources.”<sup>9</sup> A common example is the level of output from sources (e.g., the number of carbon dioxide-emitting vehicles on the road, or the amount of effluent released from point-sources into rivers).

### State

*State refers to measures of the quality of the environment and the quantity of natural resources.* A typical example is the concentration of a particular pollutant in a media (e.g., concentration of ozone-damaging pollutant in the air or count of fecal coliform in water).<sup>10</sup>

### Impacts

*Impacts are the effects that the condition of the environment has on people, animals, and ecological processes.* For health-based environmental indicators, Impacts can be further separated into both Exposure and Effect. Common examples are the degree of disease and exposure to environmental contaminants in biological populations (e.g., incidence of gastro-intestinal disease in a county).

### Responses

*Responses are the efforts undertaken by society to respond to environmental changes and issues.* As targeted action measures, Responses are typically expressed as program activities (e.g., number of inspections conducted or number of farm workers trained on pesticide risks).

DPSIR is able to provide a more comprehensive and unified conceptual framework to the diverse and binational professional body of Border 2012, thereby facilitating communication and cooperation. It is a resilient model that it can be tailored to fit the needs of specific programs by emphasizing the indicator compartments of interest. Finally, DPSIR is well suited to the Border 2012 program because it allows for the identification and analysis of relationships between border-specific development actions and the effects produced on the environment and human health. The enhanced understanding of these relationships would allow policy-makers to develop the region in a sustainable manner, aware of potential environmental and human health consequences.

## IV. INDICATOR DEFINITIONS

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<sup>8</sup> United Nations University. *Regions at Risk: Comparisons of Threatened Environments* 1995. <http://www.unu.edu/unupress/unupbooks/uul4re/uul4re0u.htm>

<sup>9</sup> Organization for Economic Co-operation and Development. 1993. “Environmental Monographs, N° 83: OECD core set of indicators for environmental performance reviews.” Paris. Available at: <http://lead.virtualcentre.org/en/dec/toolbox/Refer/gd93179.pdf>

<sup>10</sup> US EPA, *The 1997 U.S.-Mexico Border Environmental Indicators Report*



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Indicators are more than just any given measurement; they are the interpretation of the available data. The 2003 United Nations World Water Development Report stated that “an indicator, comprising a single data (a variable) or an output value from a set of data (aggregation of variables), describes a system or process such that it has significance beyond the face value of its components. It aims to communicate information on the system or process.”<sup>11</sup>

This definition implies that, regardless of the type of measurement from which they derive, indicators convey information on a system or process in a way that is meaningful for their users. Therefore, indicators should be useful, versatile tools that allow one to understand and assess a system, predict and test relationships between compartments, formulate policy, and make well informed decisions. For the Border 2012 program, indicators will be identified as either environmental or program indicators, and further classified according to the DPSIR framework. While this framework serves as a systems guide, indicators should not be limited by it, and the exact composition of the framework may change in response to the needs of the stakeholders and the actions under evaluation.

The environmental and program indicator definitions are specific to the Border 2012 program and keyed to what the indicators do.

- **Environmental Indicators** communicate information regarding the region’s environmental and health conditions. They aid in:
  - Measuring progress toward meeting Border 2012 outlined goals and objectives;
  - Assessing conditions and trends in the Driving Forces, Pressures, State, or Impacts compartments of DPSIR in order to show improvement or deficiencies in the system; and/or
  - Understanding the relationship between the different compartments in order to make predictive associations between two compartments of DPSIR and formulate policy. Associations should be quantitative (when available), and either correlative or causative.
- **Program Indicators** communicate information regarding environmental management activities and targeted response measures. They aid in:
  - Measuring progress toward meeting Border 2012 outlined goals and objectives; and/or
  - Understanding the effect of response actions (the Response compartment) on another DPSIR compartment and/or on influencing the overall DPSIR system in order to evaluate the program.

Both environmental and program indicators are necessary for evaluating the effectiveness of the Border 2012 program in improving the region’s environmental and health-related conditions. While the two indicator types should not be used interchangeably, the use of an integrated set of indicators will provide representative, meaningful information. Environmental indicators are

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<sup>11</sup> United Nations World Water Development Report. 2003. Chapter 3, “Signing Progress: Indicators Mark the Way.” Available at: [http://www.unesco.org/water/wwap/wwdr/table\\_contents.shtml](http://www.unesco.org/water/wwap/wwdr/table_contents.shtml)



distinctly identified by their ability to communicate information about the Driving Forces, Pressure, State, or Impact portions of the system, while program indicators inform about the Response portion or general administrative activities.

Indicators are therefore able to serve the many needs of the Border 2012 program, including describing an environmental factor at a given moment, showing trends, or measuring progress towards a given goal. Indicators also help to describe the overall system, and it is through this systems view that understanding is increased and a basis is formed on which to make well informed decisions. Indicators can gauge program accomplishments and can significantly aid in planning and management processes.

## V. PROCESS FOR INDICATOR DEVELOPMENT

Developing indicators under a systematic method, standardized to all Border 2012 entities, is important as a common approach will allow for continuity between partners and efforts. The development process for Border 2012 indicators can be broken down into six distinct steps:<sup>12</sup>

1. Define the information need
2. Select a conceptual framework
3. Formulate potential indicators
4. Evaluate potential indicators on the basis of selection criteria
5. Adopt/develop/implement indicators
6. Review indicators

### 1. Define the information need

The Border 2012 program identifies six priority areas, which can be divided into two categories: 1) media-specific, including water, air, and land; and 2) cross-dimensional media, including environmental health, emergency preparedness and response, and cooperative enforcement and compliance. Information is needed about each of these areas, specifically on how well the corresponding objectives are being met. Comprehensively, the goals of Border 2012 aim to improve the environmental health of the region; thus, information is needed about the environmental and health conditions of the border area. The cross-dimensional categories are unique in that they inherently relate to the media-specific categories, and consequently, require multi-faceted information to show progress. These indicators would be written for an audience of the public and policy makers at all levels.

### 2. Select a conceptual framework

DPSIR, as described earlier, offers a systemic and comprehensive approach for organizing indicators in the Border 2012 program. A conceptual framework generally has three main purposes: 1) to provide a visual abstraction of how the different factors interrelate, 2) to define and delineate the important concepts and organize these into a logical structure, and 3) to assist in the interpretation of the developed indicators. Utilizing a common framework will aid the Border 2012 program in conducting statistical measurements, data analysis, analytical interpretation, and communication that are required to develop and effectively use indicators.

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<sup>12</sup> Adapted from United Nations World Water Development Report. 2003. Chapter 3, "Signing Progress: Indicators Mark the Way." Available at: [http://www.unesco.org/water/wwap/wwdr/table\\_contents.shtml](http://www.unesco.org/water/wwap/wwdr/table_contents.shtml)



### **3. Formulate potential indicators**

The antecedent Border XXI program initiated the binational indicator development process, thus facilitating the formulation of potential indicators for the Border 2012 program. Indicator works conducted by partner organizations such as SCERP and PAHO, and by the state and federal governments of the US and Mexico, serve as a primary resource for the formulation of indicators. However, input is necessary from all stakeholders, particularly the media groups corresponding to the program goals. Hence, several review phases are required so that the indicators identified (see Appendix A) are both relevant to the program's goals and objectives, and representative of the various taskforces' actions being implemented to improve the environmental and health conditions of the border region. The outcome will be a binational set of potential Border 2012 indicators, which should then be evaluated on the basis of selection criteria.

### **4. Evaluate potential indicators on the basis of selection criteria**

Each potential indicator should be evaluated on the basis of selection criteria, which is organized into three tiers: core, quality of data availability and media-specific. Although the final indicator criteria may vary slightly by the needs of a given work group or task force, there is a set of criteria that is fundamental to the Border 2012 program.

#### **Tier 1: Core Criteria**

Core criteria<sup>13</sup> are of equal importance and should be met by all indicators developed for the Border 2012 program

- ***Representative***

All indicators should be representative of what they purport to describe in a binational nature. Although the ideal indicator would be one measure that can be collected on both sides of the border, it is also possible to have a matched pair of indicators collected in both countries that are comparable in scope and have the potential to be harmonized. This caveat is created specifically for situations in which it is not feasible to collect data by the same method in each country.

- ***Policy relevance***

Indicators must provide relevant information to management and policy areas as well as to society's concerns about ecological conditions and/or human health. Specifically, indicators should provide useful and accurate information about the state of the border's environment, measure changes and trends in those conditions. As a result, indicators should help clarify the relationship between the natural system and human activities, providing a useful tool for improved decisions and policies. For Border 2012 indicators, "policy relevance" can be defined as the ability of an indicator to address program objectives and goals and lead to policy applications on the US-Mexico border.

- ***Scientific validity and methodological rigor***

Technical and scientific accuracy are characteristics that support the reliability and validity of an indicator.<sup>14</sup> Ideally, indicators should be based on accurate measurements

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<sup>13</sup> Adapted from Selman, 1996; PAHO, 2001, Jackson, 2003; OECD, 2003; Pastille, 2002.

<sup>14</sup> PAHO, 2001.



(or data) that produce consistent results.. The data must also be precise enough that the indicator is able to address its intended purpose; otherwise, the indicator would lose power and utility. However, requiring a quantifiable measure does not mean that indicators should be complicated. On the contrary, it is important to keep indicators simple and easy to interpret.

- ***Sensitive to change***

Indicators must be flexible and responsive to changes in the border region. Developing indicators may require a target or baseline in order to measure significant changes that occur later in time. This is needed to acknowledge the factors that can affect the values represented by the indicators: errors of measurement or natural variability (spatial or temporal) variability.<sup>15</sup> For this reason, the data of Border 2012 indicators should be collected and reviewed frequently enough for it to reflect the true conditions of the system.

- ***Public understanding and acceptance***

Indicators play an important role in raising public awareness. Hence, indicators should be transparent and simple enough to be understood by the public. A well informed public is more likely to be involved in the border initiative. Public acceptance of Border 2012 indicators will depend on the active participation of communities in identifying their own perceptions and interests regarding their information needs. Ultimately, public acceptance will affect overall policy performance.

## ***Tier 2: Quality of Data Availability Criteria***

After this first evaluation, potential indicators need to be assessed with regard to the availability of quality data. If data is insufficient or unavailable, the feasibility of collecting the necessary data for future development of the proposed indicator should be determined. If future development is possible, an alternate potential indicator may be developed and calculated as an interim measure. If not, another indicator should be formulated and proceed with the evaluation process.

- ***Information availability***

The availability of valid data is a fundamental consideration for an indicator. In most cases, it will be preferable to select indicators that derive from pre-existing data sets because it may be cost-effective and result in a timelier fashion. Moreover, if data already exists, it can be used as a baseline. On the other hand, a data gap should not necessarily prohibit the development of an indicator, if the potential uses of the indicator are deemed sufficiently valuable. In this case, the most appropriately available indicator would be used until the data for the ideal indicator is gathered.

- ***Information compatibility***

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<sup>15</sup> Jackson, Laura E., Kurtz, J and Fisher, W, eds. (2000). *Evaluation Guidelines for Ecological Indicators*. EPA/620/R-99/005. U.S. Environmental Protection Agency, Office of Research and Development, Research Triangle Park, NC



Indicator data must be accessible by a variety of stakeholders in both countries to be used for any given number of purposes. This means that datasets that can easily be used for other Border 2012 indicator tasks will be more appealing than measures that are singular or unique. The compatibility of data is particularly crucial since Border 2012 indicators will be used across national boundaries and data management systems. Also, where feasible, indicators should be similar to or the same as the indicators used to report on national environmental conditions respectively in the US and Mexico.

### **Tier 3: *Media-specific Criteria***

Because the objectives of each Border 2012 group differ, additional criteria should be introduced by the individual groups in developing the indicators. These criteria should be delineated based on the workgroup or policy forum needs and program objectives. A sample list of additional criteria is included here, but groups should add to or detract from this list as necessary.

- ***Appropriate spatial and temporal scale***

Consideration of scale brings up problems of aggregation or disaggregation of data: the ability of data to be combined or separated to obtain relevant information. For example, data gathered at a regional spatial scale may not accurately represent the local situation, and data gathered at a local scale may not be applicable to a region. Alternately, data gathered with a specific temporal scale may not adequately account for trends such as seasonality. Unless aggregation is feasible, datasets that were collected at different scales (spatial or temporal) will be difficult to merge.

- ***Feasibility/cost effectiveness of implementation***

Indicators must be developed with consideration of costs, logistics and institutional requirements, including administrative time. The development and maintenance of a systematic and reliable database requires monitoring and updating that can be costly enough to exceed the benefits of developing the indicators. The developers of indicators should be able to predict that a net benefit will result from their investment.

After assessing the potential indicators by the above criteria, those that meet the criteria will be included in the binational basic set of indicators and recommended for the Border 2012 program. Agreeing to track a common set of indicators will make binational, border-wide analysis feasible. It is important to note that the basic set of indicators may change over time to accommodate for better indicators, or to include more specific, localized indicators that have increased in border-wide importance.

## **5. Adopt/Develop/Implement indicators**

Once the basic set of indicators has been recommended the next step is to reach border-wide consensus in order to develop and implement these indicators. In developing the indicators, caveats may surface such as a lack of sufficient or adequate data or a lack of resources to gather and process data. Indicators that cannot be feasibly developed will not be selected for the initial indicator set, but may be incorporated in the future. Whichever indicator is to be implemented necessitates consensus of program stakeholders. The implementers should feel



confident that the indicator is of high quality and similarly the regional work groups should feel confident that the indicator will provide them with a valuable resource in addressing local issues. Upon reaching consensus, a definite set of indicators will be officially adopted by the Border 2012 program as the basis for tracking progress toward achieving the Program objectives and goals, and for reporting on changes in border environmental and health conditions.

### 6. Review indicators

Indicators can be used on either an ongoing basis or for a finite period of time. Regardless of the length of data collection or indicator usage, a review process is necessary to evaluate the performance of the indicator. What may be a useful indicator at the present may change with time, given the development of technology, further improvements along the border, changing needs of the public or increased insights in policy or science. The review should answer at least the following questions:

- Purpose – *Why was the indicator developed?*
- Data collection and management – *What protocol was followed?*
- Data reliability – *Is the source reliable?*
- Quality assurance – *How accurate and precise is the data?*
- Information – *What does the indicator convey? Is it true to its purpose? How does the information compare to the standard?*
- Limitations – *What are the outstanding gaps or limitations of the indicator?*
- Conclusion – *Is the data useful and should the indicator continue to be used?*<sup>16</sup>

The BITF proposes that a review occur two years after an indicator is first implemented, and then every five years thereafter. However, ultimate decision lies with the National Coordinators, who will periodically review the indicators and report the result to the workgroups, fora and the public.

## VI. STRATEGY - Vision for Border 2012 Indicators

With the selection of a conceptual framework, program-wide criteria, indicator terminology, and a list of potential indicators for Border 2012, the BITF hopes to provide a solid foundation for the development of indicators. As indicator development is a collaborative process, all entities are responsible for developing indicators and assuring that there is at least one candidate indicator that meets the respective Border 2012 goal or objective.

### Communication:

As indicators are developed, it is important to remember that communication is key between and among the binational regional and border-wide work groups, policy fora, and local task forces. Both successes and lessons learned should be shared widely, especially with the BITF and National Program Coordinators. Additionally, indicators will only be successful if they are truly

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<sup>16</sup> Adapted from Niskar AS. The development of a guide to evaluate the usefulness of data sources for environmental public health surveillance (dissertation). Chapel Hill (NC): University of North Carolina;2003.



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binational in nature, so it is essential that final documents be made available in both languages. Since one of the purposes of indicators is to evaluate the outcomes of the Border 2012 program, these outcomes should be transparent and simple to understand by the border communities.

## VII. CONCLUSION

The mission of the Border 2012 program is “to protect the environment and public health of the U.S.-Mexico border region, consistent with the principles of sustainable development.” Since the majority of the program objectives are programmatic in nature, stakeholders should strive to meet these objectives, yet also reach beyond the guidelines of the framework. This is important because fulfilling the mission will require a broad perspective, careful research, and monitoring of progress.

The use of indicators has emerged as a promising tool that allows events in complex systems to be monitored, modeled, and ultimately predicted. These capacities will provide policy-makers tools with which to address the needs of the communities they serve. Because the participants of the Border 2012 program represent many different interests, a common method of documenting and analyzing border conditions and Border 2012 programs is necessary. The Border Indicators Task Force has sought with this strategy document to provide a framework for a common methodology and conceptualization of indicators.

The BITF’s goal is that Border 2012 indicators will be sustainable and well maintained, so that they remain useful resources. Indicator development – as an ongoing, flexible process – will continue to be adapted as data becomes available and conditions change.

The BITF expects that increasing understanding of border conditions, strengthening the capacity of health professionals and environmental regulators and policy makers to respond to crises, and reporting accurately the strengths and weaknesses of Border 2012 projects will be the outputs of the indicators project. These successes will provide the necessary evidence and possible solutions to make lasting improvements in health and environmental quality in the border region.

The United States and Mexico share problems in the border region; these countries must learn to share solutions as well. The Border 2012 program will be at its strongest when its members are able to work cooperatively. Likewise, the indicator program will function best when it has input from all stakeholders. Despite the challenges of trans-national work, the BITF believes that indicators research will strengthen communication, data-sharing, technology transfer, and scientific collaboration across the border. Working together, we will have the most complete set of knowledge and resources to help create a healthy border region for everyone.

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## APPENDIX A

### ACRONYMS

### ABREVIATURAS

BITF	Border Indicators Task Force	Equipo de Trabajo de Indicadores Fronterizos
CDC	Centers for Disease Control and Prevention	Centro para el Control y la Prevención de Enfermedades
DPSIR	Driving Forces-Pressure-State-Impact-Response	Fuerza Motriz- Presión-Estado-Impacto-Respuesta
OECD (OCDE)	Organization for Economic Co-operation and Development	Organización para la Cooperación y el Desarrollo Económico
PAHO	Pan American Health Organization	Organización Panamericana de la Salud (OPS)
PSR	Pressure-State-Response	Presión-Estado-Respuesta (PER)
SCERP	Southwest Consortium for Environmental Research and Policy	Centro de Investigación y Política Ambiental del Suroeste
SEMARNAT	Mexico's Secretariat of Environment and Natural Resources	Secretaría de Medio Ambiente y Recursos Naturales
UNEP	United Nations Environment Program	Programa de la Naciones Unidas para el Medio Ambiente (PNUMA)
USEPA	U.S. Environmental Protection Agency	Agencia de Protección Ambiental de los EE.UU
WHO	World Health Organization	Organización Mundial de la Salud (OMS)